NEW GUIDELINES FOR HYPERTENSION DIAGNOSIS

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Alabama Cardiovascular Health Network Quarterly Meeting
Alabama Department of Public Health
Cardiovascular and Diabetes Branch
Clanton, Alabama
Wednesday, December 6, 2017

2017 Guideline for the Management of Patients with Hypertension

INITIATIVE LEAD BY

- American College of Cardiology (ACC)
- American Heart Association (AHA)

NINE ADDITIONAL PARTNERS

- American Academy of Physician Assistants
- American College of Preventive Medicine
- American Geriatrics Society
- American Pharmacists Association
- American Society of Hypertension
- American Society of Preventive Cardiology
- Association of Black Cardiologists
- National Medical Association
- Preventive Cardiovascular Nurses Association

FOLLOWS 2011 IOM RECOMMENDATIONS

WRITING COMMITTEE

- Multidisciplinary (21 members)
- No relationships with industry

PROCESSES STANDARDIZED

- Recs supported by evidence tables
- PICOT questions (ERC analysis)
- Rec interpretation (COR and LOE)
- Peer review (internal & external)

ERC = Evidence Review Committee
COR = Class of Recommendation
LOE = Level of Evidence

2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults

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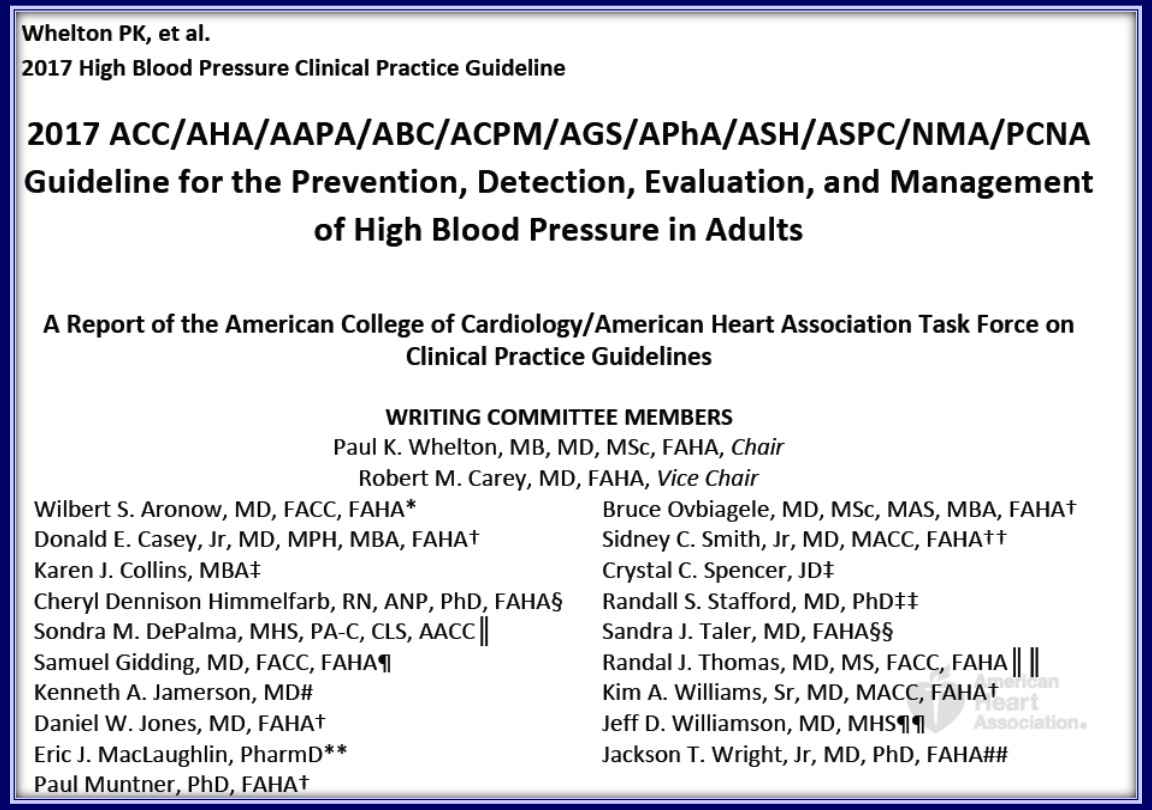

Whelton PK, et al.
2017 High Blood Pressure Clinical Practice Guideline

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Jackson T. Wright, Jr, MD, PhD, FAHA##

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2017 High Blood Pressure Guideline Writing Committee

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*American Society for Preventive Cardiology Representative. †ACC/AHA Representative. ‡Lay Volunteer/Patient Representative. §Preventive Cardiovascular Nurses Association Representative. ‖American Academy of Physician Assistants Representative. ¶Task Force Liaison. #Association of Black Cardiologists Representative. **American Pharmacists Association Representative. ††ACC/AHA Prevention Subcommittee Liaison. ‡‡American College of Preventive Medicine Representative. §§American Society of Hypertension Representative. ‖ ‖Task Force on Performance Measures Liaison. ¶¶American Geriatrics Society Representative. ##National Medical Association Representative.

Applying Class of Recommendation and Level of Evidence to Clinical Strategies, Interventions, Treatments, or Diagnostic Testing in Patient Care*

(Updated August 2015)

CLASS (STRENGTH) OF RECOMMENDATION

CLASS I (STRONG) — **Benefit >>> Risk**

Suggested phrases for writing recommendations:
- Is recommended
- Is indicated/useful/effective/beneficial
- Should be performed/administered/other
- Comparative-Effectiveness Phrases†:
  - Treatment/strategy A is recommended/indicated in preference to treatment B
  - Treatment A should be chosen over treatment B

CLASS IIa (MODERATE) — **Benefit >> Risk**

Suggested phrases for writing recommendations:
- Is reasonable
- Can be useful/effective/beneficial
- Comparative-Effectiveness Phrases†:
  - Treatment/strategy A is probably recommended/indicated in preference to treatment B
  - It is reasonable to choose treatment A over treatment B

CLASS IIb (WEAK) — **Benefit ≥ Risk**

Suggested phrases for writing recommendations:
- May/might be reasonable
- May/might be considered
- Usefulness/effectiveness is unknown/unclear/uncertain or not well established

CLASS III: No Benefit (MODERATE) — **Benefit = Risk**

(Generally, LOE A or B use only)

Suggested phrases for writing recommendations:
- Is not recommended
- Is not indicated/useful/effective/beneficial
- Should not be performed/administered/other

CLASS III: Harm (STRONG) — **Risk > Benefit**

Suggested phrases for writing recommendations:
- Potentially harmful
- Causes harm
- Associated with excess morbidity/mortality
- Should not be performed/administered/other

LEVEL (QUALITY) OF EVIDENCE‡

LEVEL A
- High-quality evidence‡ from more than 1 RCT
- Meta-analyses of high-quality RCTs
- One or more RCTs corroborated by high-quality registry studies

LEVEL B-R (Randomized)
- Moderate-quality evidence‡ from 1 or more RCTs
- Meta-analyses of moderate-quality RCTs

LEVEL B-NR (Nonrandomized)
- Moderate-quality evidence‡ from 1 or more well-designed, well-executed nonrandomized studies, observational studies, or registry studies
- Meta-analyses of such studies

LEVEL C-LD (Limited Data)
- Randomized or nonrandomized observational or registry studies with limitations of design or execution
- Meta-analyses of such studies
- Physiological or mechanistic studies in human subjects

LEVEL C-EO (Expert Opinion)

Consensus of expert opinion based on clinical experience

COR and LOE are determined independently (any COR may be paired with any LOE).

A recommendation with LOE C does not imply that the recommendation is weak. Many important clinical questions addressed in guidelines do not lend themselves to clinical trials. Although RCTs are unavailable, there may be a very clear clinical consensus that a particular test or therapy is useful or effective.

* The outcome or result of the intervention should be specified (an improved clinical outcome or increased diagnostic accuracy or incremental prognostic information).

† For comparative-effectiveness recommendations (COR I and IIa; LOE A and B only), studies that support the use of comparator verbs should involve direct comparisons of the treatments or strategies being evaluated.

‡ The method of assessing quality is evolving, including the application of standardized, widely used, and preferably validated evidence grading tools; and for systematic reviews, the incorporation of an Evidence Review Committee.

COR indicates Class of Recommendation; EO, expert opinion; LD, limited data; LOE, Level of Evidence; NR, nonrandomized; R, randomized; and RCT, randomized controlled trial.

AMERICAN COLLEGE of CARDIOLOGY

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Systematic Review Questions on High BP in Adults

Question Number	Question
1	Is there evidence that self-directed monitoring of BP and/or ambulatory BP monitoring are superior to office-based measurement of BP by a healthcare worker for 1) preventing adverse outcomes for which high BP is a risk factor and 2) achieving better BP control?
2	What is the optimal target for BP lowering during antihypertensive therapy in adults?
3	In adults with hypertension, do various antihypertensive drug classes differ in their comparative benefits and harms?
4	In adults with hypertension, does initiating treatment with antihypertensive pharmacological monotherapy versus initiating treatment with 2 drugs (including fixed-dose combination therapy), either of which may be followed by the addition of sequential drugs, differ in comparative benefits and/or harms on specific health outcomes?

BP indicates blood pressure.

2017 Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults

A comprehensive guideline that represents an update of JNC 7, **not** the focused JNC 8 (2014 Guideline)

- Reclassification of high blood pressure
- BP treatment thresholds and ASCVD risk
- BP treatment goals
- Management of hypertension in patients with comorbidities
- Recommendations for BP management in older adults

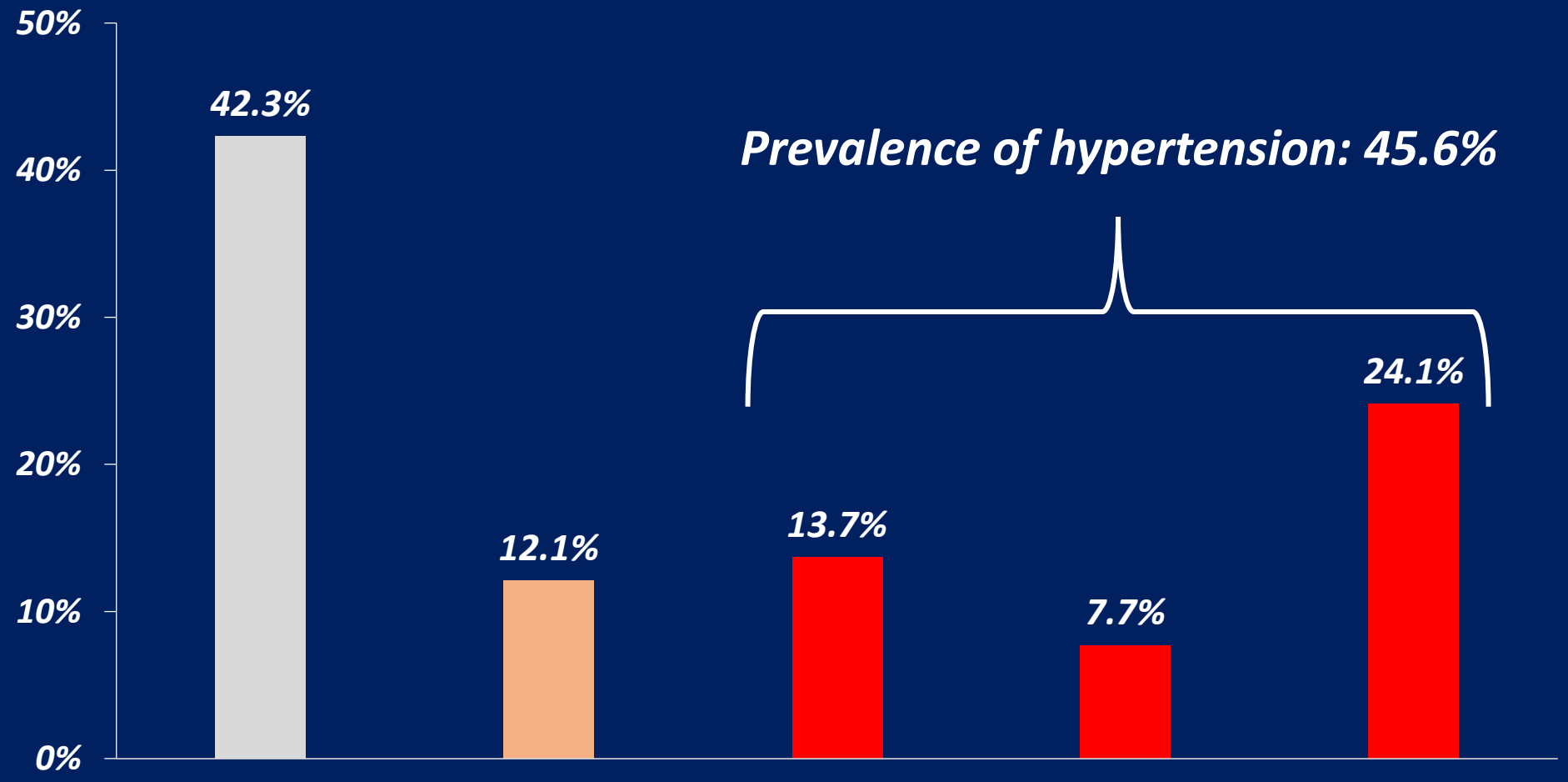
2017 Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults

BP Classification (JNC 7 and ACC/AHA Guidelines)

SBP		DBP	JNC 7	2017 ACC/AHA
<120	and	<80	Normal BP	Normal BP
120–129	and	<80	Prehypertension	Elevated BP
130–139	or	80–89	Prehypertension	Stage 1 hypertension
140–159	or	90-99	Stage 1 hypertension	Stage 2 hypertension
≥160	or	≥100	Stage 2 hypertension	Stage 2 hypertension

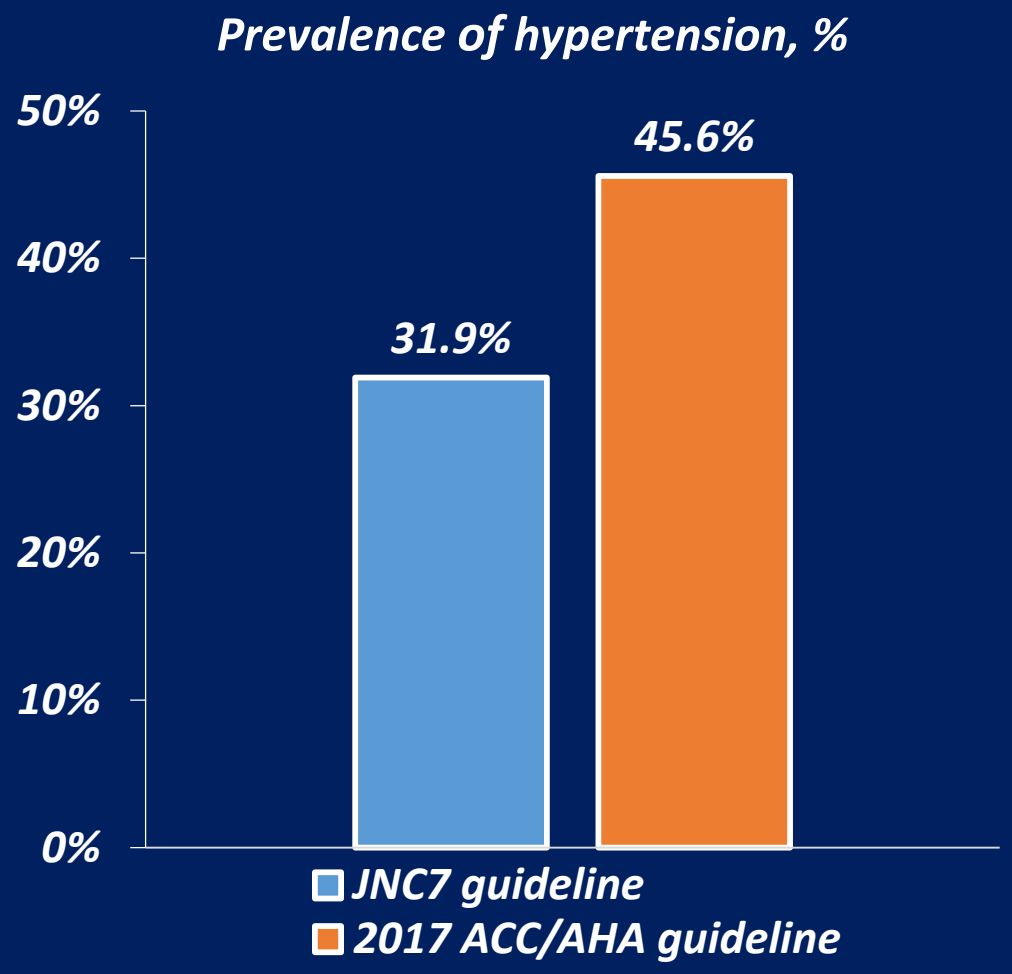
- Blood Pressure should be based on an average of ≥2 careful readings on ≥2 occasions
- Adults being treated with antihypertensive medication designated as having hypertension

Distribution of US adults into BP Categories – NHANES 2011-2014

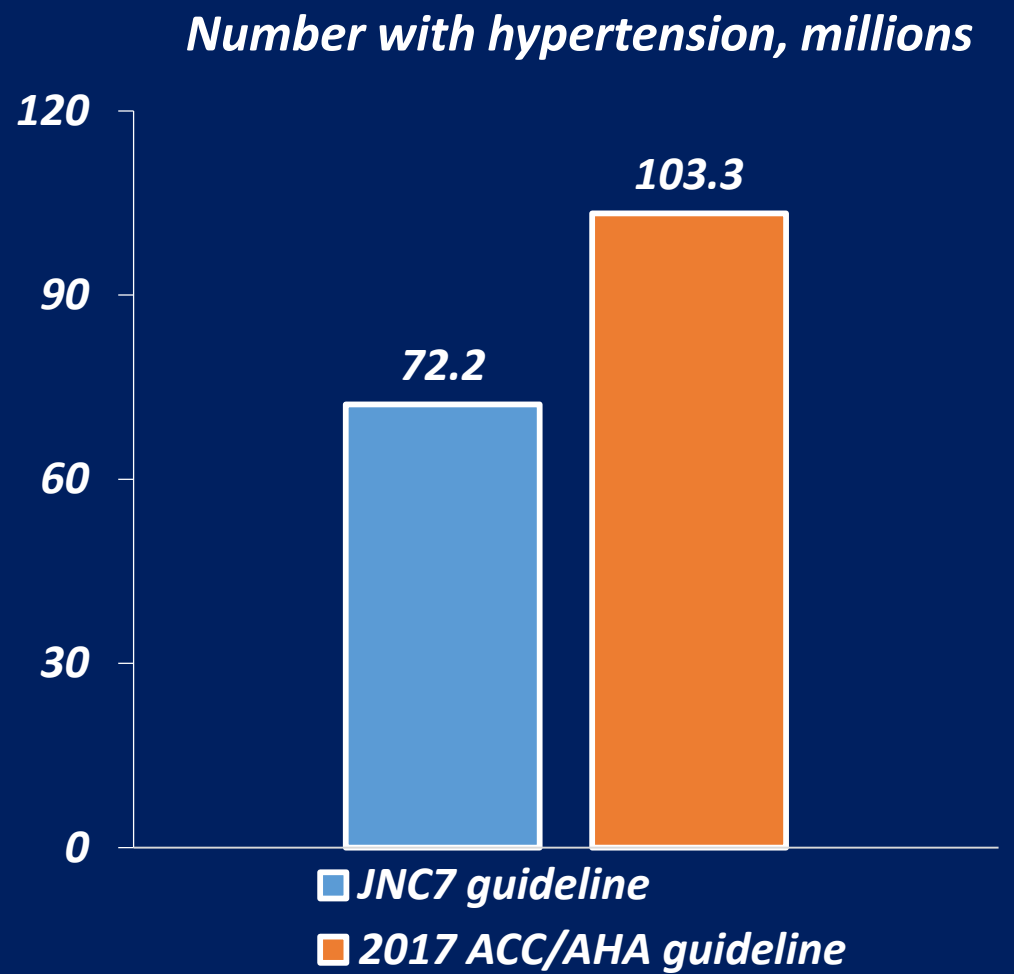


Muntner et. al., JACC. 2017 (in press)
Muntner, et. al., Circulation. 2017 (in press)

Prevalence of Hypertension – 2017 ACC/AHA and JN7 Guidelines

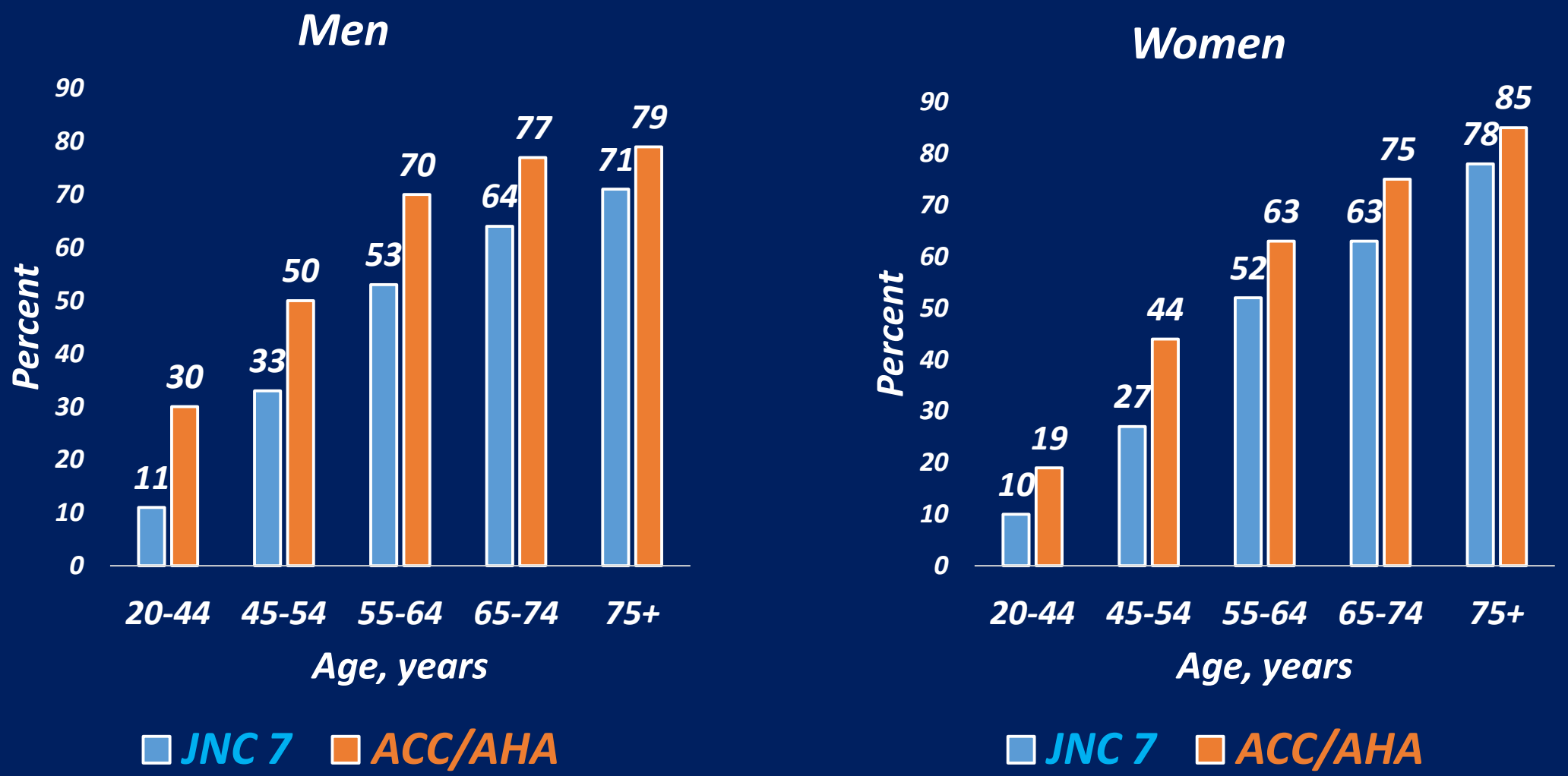


Whelton PK et al. Hypertension. 2017
Whelton PK et al. JACC. 2017



Muntner et. al. JACC. 2017
Muntner, et. al. Circulation 2017

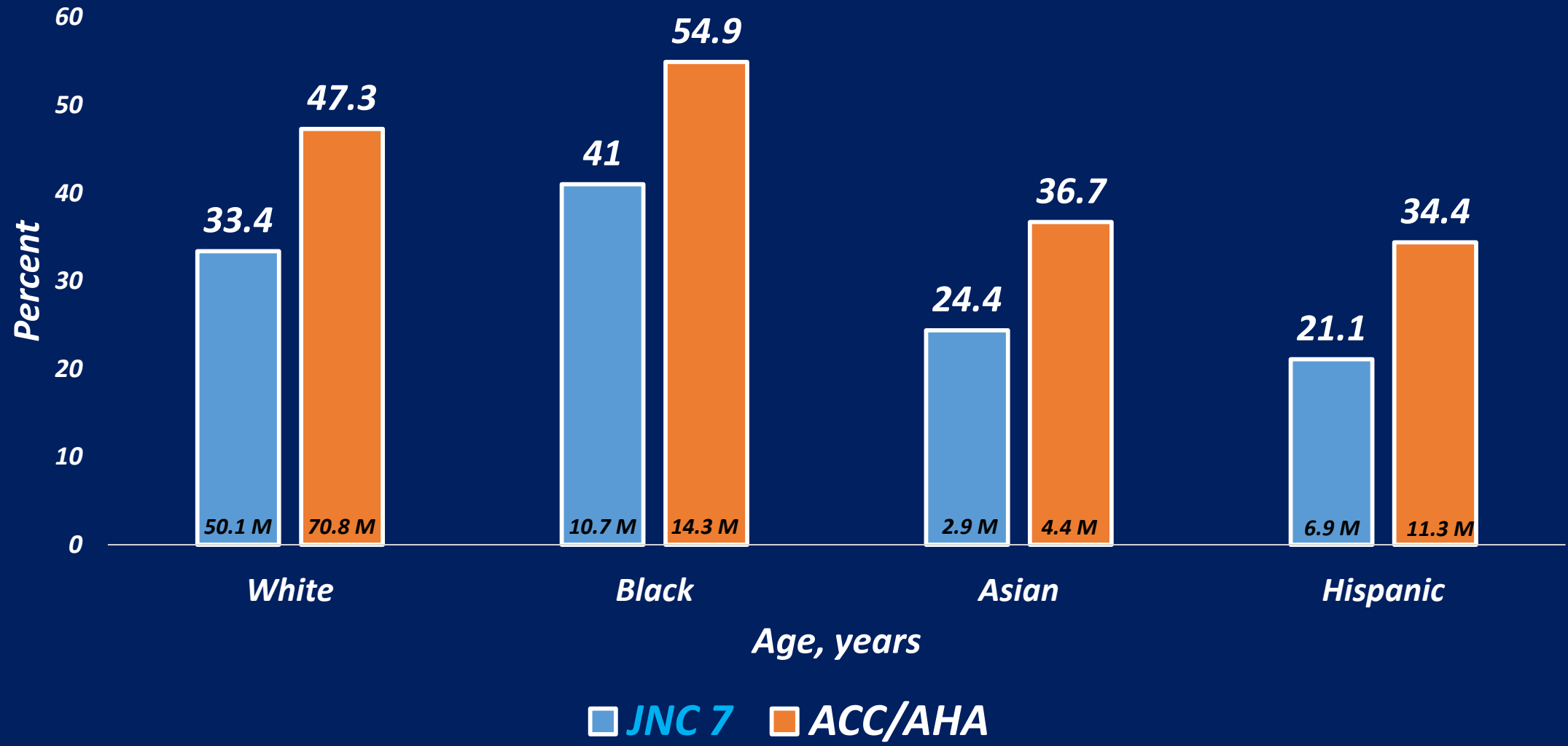
Comparison of Prevalence using the 2003 JNC 7 and 2017 BP Guideline Definitions of Hypertension, by Age and Sex



Whelton PK et al. Hypertension. 2017

Whelton PK et al. JACC. 2017

Comparison of Prevalence using the 2003 JNC 7 and 2017 BP Guideline Definitions of Hypertension, by Race-Ethnicity



Whelton PK et al. Hypertension. 2017
Whelton PK et al. JACC 2017

Measurement of BP

Accurate Measurement of BP in the Office

COR	LOE	Recommendation for Accurate Measurement of BP in the Office
I	C-EO	For diagnosis and management of high BP, proper methods are recommended for accurate measurement and documentation of BP.

Checklist for Accurate Measurement of BP

Key Steps for Proper BP Measurements
Step 1: Properly prepare the patient.
Step 2: Use proper technique for BP measurements.
Step 3: Take the proper measurements needed for diagnosis and treatment of elevated BP/hypertension.
Step 4: Properly document accurate BP readings.
Step 5: Average the readings.
Step 6: Provide BP readings to patient.

Selection Criteria for BP Cuff Size for Measurement of BP in Adults

Arm Circumference	Usual Cuff Size
22–26 cm	Small adult
27–34 cm	Adult
35–44 cm	Large adult
45–52 cm	Adult thigh

Out-of-Office and Self-Monitoring of BP

COR	LOE	Recommendation for Out-of-Office and Self-Monitoring of BP
I	A^{SR}	Out-of-office BP measurements are recommended to confirm the diagnosis of hypertension and for titration of BP-lowering medication, in conjunction with telehealth counseling or clinical interventions.

SR indicates systematic review.

BP Patterns Based on Office and Out-of-Office Measurements

	Office/Clinic/Healthcare Setting	Home/Nonhealthcare/ABPM Setting
Normotensive	No hypertension	No hypertension
Sustained hypertension	Hypertension	Hypertension
Masked hypertension	No hypertension	Hypertension
White coat hypertension	Hypertension	No hypertension

ABPM indicates ambulatory blood pressure monitoring; and BP, blood pressure.

Corresponding Values of SBP/DBP for Clinic, HBPM, Daytime, Nighttime, and 24-Hour ABPM Measurements

Clinic	HBPM	Daytime ABPM	Nighttime ABPM	24-Hour ABPM
120/80	120/80	120/80	100/65	115/75
130/80	130/80	130/80	110/65	125/75
140/90	135/85	135/85	120/70	130/80
160/100	145/90	145/90	140/85	145/90

ABPM indicates ambulatory blood pressure monitoring; BP, blood pressure; DBP diastolic blood pressure; HBPM, home blood pressure monitoring; and SBP, systolic blood pressure.

Masked and White Coat Hypertension

COR	LOE	Recommendations for Masked and White Coat Hypertension
IIa	B-NR	In adults with an untreated SBP greater than 130 mm Hg but less than 160 mm Hg or DBP greater than 80 mm Hg but less than 100 mm Hg, it is reasonable to screen for the presence of white coat hypertension by using either daytime ABPM or HBPM before diagnosis of hypertension.
IIa	C-LD	In adults with white coat hypertension, periodic monitoring with either ABPM or HBPM is reasonable to detect transition to sustained hypertension.
IIa	C-LD	In adults being treated for hypertension with office BP readings not at goal and HBPM readings suggestive of a significant white coat effect, confirmation by ABPM can be useful.

Masked and White Coat Hypertension (cont.)

COR	LOE	Recommendations for Masked and White Coat Hypertension
IIa	**B-NR**	In adults with untreated office BPs that are consistently between 120 mm Hg and 129 mm Hg for SBP or between 75 mm Hg and 79 mm Hg for DBP, screening for masked hypertension with HBPM (or ABPM) is reasonable.
IIb	**C-LD**	In adults on multiple-drug therapies for hypertension and office BPs within 10 mm Hg above goal, it may be reasonable to screen for white coat effect with HBPM (or ABPM).
IIb	**C-EO**	It may be reasonable to screen for masked uncontrolled hypertension with HBPM in adults being treated for hypertension and office readings at goal, in the presence of target organ damage or increased overall CVD risk.
IIb	**C-EO**	In adults being treated for hypertension with elevated HBPM readings suggestive of masked uncontrolled hypertension, confirmation of the diagnosis by ABPM might be reasonable before intensification of antihypertensive drug treatment.

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BP THRESHOLDS AND RECOMMENDATIONS FOR TREATMENT OF HYPERTENSION

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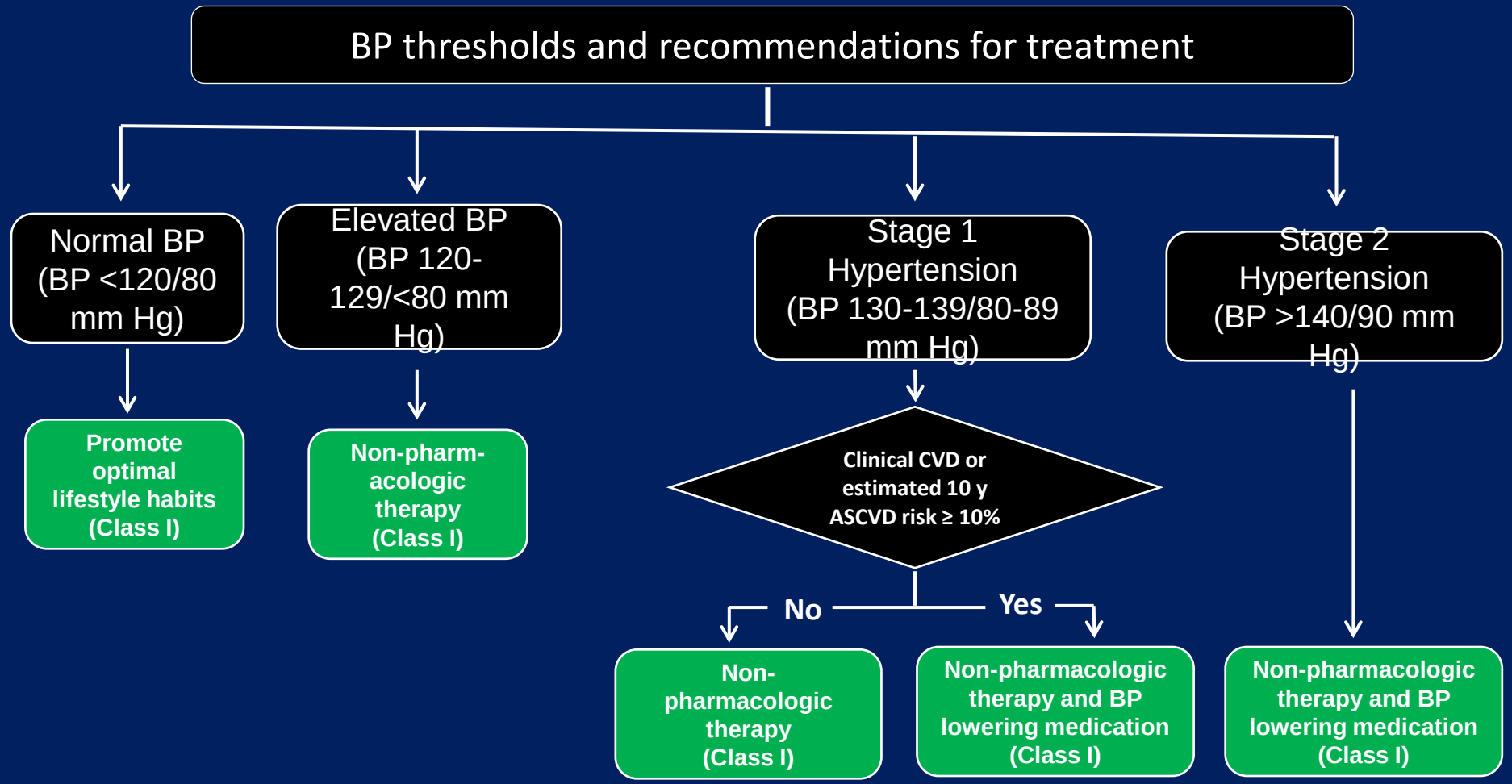

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NONPHARMACOLOGIC (LIFESTYLE) INTERVENTIONS FOR PREVENTION AND TREATMENT OF HYPERTENSION

	Nonpharmacologic Intervention	Dose
Weight loss	Weight/body fat	Ideal body weight best goal, but at least 1 kg reduction in body weight for most adults
Healthy diet	DASH dietary pattern	Diet rich in fruits, vegetables, whole grains, and low-fat dairy products with low saturated and total fat
Reduce sodium intake	Dietary sodium	<1,500 mg/day optimal, but at least 1,000 mg reduction in most adults
Enhance potassium intake	Dietary potassium	3,500 mg/day, preferably by consumption of a diet rich in potassium
Physical activity	Aerobic, dynamic resistance, isometric resistance	90-150 min/week
Moderate alcohol intake	Alcohol consumption	Men: limit to 2 drinks daily Women: limit to 1 drink daily

CVD Risk Factors Common in Patients With Hypertension

Modifiable Risk Factors*	Relatively Fixed Risk Factors†
• Current cigarette smoking, secondhand smoking • Diabetes mellitus • Dyslipidemia/hypercholesterolemia • Overweight/obesity • Physical inactivity/low fitness • Unhealthy diet	• CKD • Family history • Increased age • Low socioeconomic/educational status • Male sex • Obstructive sleep apnea • Psychosocial stress

*Factors that can be changed and, if changed, may reduce CVD risk.
†Factors that are difficult to change (CKD, low socioeconomic/educational status, obstructive sleep apnea, cannot be changed (family history, increased age, male sex), or, if changed through the use of current intervention techniques, may not reduce CVD risk (psychosocial stress).
CKD indicates chronic kidney disease; and CVD, cardiovascular disease.

ACC/AHA POOLED COHORT EQUATIONS

To estimate the 10-year risk of atherosclerotic CVD

Based on age, race sex, total cholesterol, LDL cholesterol, HDL cholesterol, treatment with a statin, systolic BP, treatment for hypertension, history of diabetes, current smoker, aspirin therapy

http://tools.acc.org/ASCVD-Risk-Estimator/

BP TREATMENT THRESHOLD AND THE USE OF ASCVD RISK ESTIMATION TO GUIDE DRUG TREATMENT OF HYPERTENSION

Recommendations for BP Treatment Threshold and Use of ASCVD Risk Estimation* to Guide Drug Treatment of Hypertension		
COR	**LOE**	**Recommendations**
I	SBP: A DBP: C-EO	1. Use of BP-lowering medications is recommended for secondary prevention of recurrent CVD events in patients with clinical CVD and an average SBP of 130 mm Hg or higher or an average DBP of 80 mm Hg or higher, and for primary prevention in adults with an estimated 10-year atherosclerotic cardiovascular disease (ASCVD) risk of 10% or higher and an average SBP 130 mm Hg or higher or an average DBP 80 mm Hg or higher.
I	C-LD	2. Use of BP-lowering medication is recommended for primary prevention of CVD in adults with no history of CVD and with an estimated 10-year ASCVD risk <10% and an SBP of 140 mm Hg or higher or a DBP of 90 mm Hg or higher

* ACC/AHA Pooled Cohort Equations to estimate 10-y risk of ASCVD. ASCVD was defined as a first nonfatal MI or CHD death, or fatal or nonfatal stroke among adults free of CVD.

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Benefits of using both BP and ASCVD risk assessment in determining BP thresholds for antihypertensive drug therapy

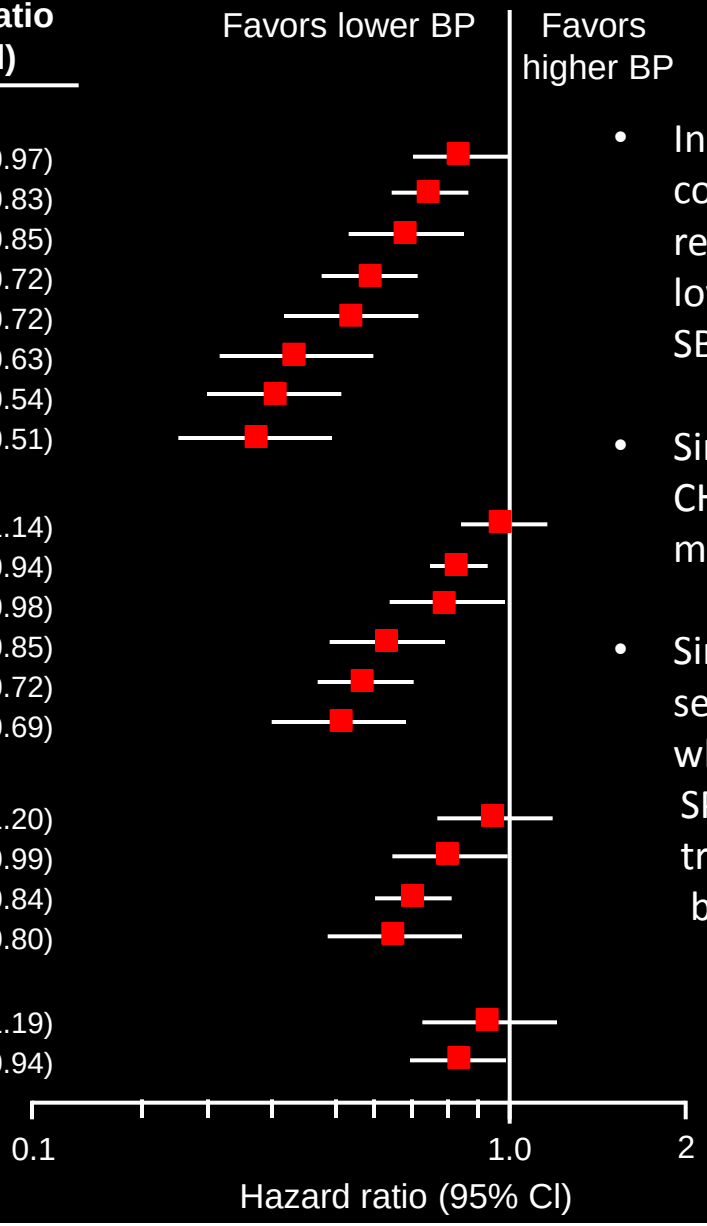
- Treatment is focused on patients most likely to have events
- More CVD events are prevented
- Larger absolute CVD risk reduction with treatment
- Lower number needed-to-treat to prevent one CVD event
- More quality-adjusted life years are saved
- Lower cost of care

BP GOAL FOR PATIENTS WITH HYPERTENSION

COR	LOE	Recommendations
I	SBP: B-R^{SR}	1. For adults with confirmed hypertension and known CVD or 10-year ASCVD event risk of 10% or higher, a BP target of less than 130/80 mm Hg is recommended.
	DBP: C-EO	
IIb	SBP: B-NR	2. For adults with confirmed hypertension, without additional markers of increased CVD risk, a BP target of less than 130/80 mm Hg may be reasonable .

MAJOR CV EVENTS

Mean Achieved Systolic Blood Pressure, mm HG	Hazard Ratio (95% CI)
Reduction to 120-124	
120-124 vs. 125-129	0.82 (0.67, 0.97)
120-124 vs. 130-134	0.71 (0.60, 0.83)
120-124 vs. 135-139	0.68 (0.55, 0.85)
120-124 vs. 140-144	0.58 (0.48, 0.72)
120-124 vs. 145-149	0.55 (0.42, 0.72)
120-124 vs. 150-154	0.46 (0.34, 0.63)
120-124 vs. 155-159	0.41 (0.32, 0.54)
120-124 vs. ≥ 160	0.36 (0.26, 0.51)
Reduction to 130-134	
130-134 vs. 135-139	0.96 (0.83, 1.14)
130-134 vs. 140-144	0.83 (0.74, 0.94)
130-134 vs. 145-149	0.78 (0.63, 0.98)
130-134 vs. 150-154	0.65 (0.51, 0.85)
130-134 vs. 155-159	0.58 (0.48, 0.72)
130-134 vs. ≥ 160	0.51 (0.39, 0.69)
Reduction to 140-144	
140-144 vs. 145-149	0.94 (0.74, 1.20)
140-144 vs. 150-154	0.79 (0.63, 0.99)
140-144 vs. 155-159	0.70 (0.60, 0.84)
140-144 vs. ≥ 160	0.62 (0.48, 0.80)
Reduction to 150-154	
150-154 vs. 155-159	0.90 (0.68, 1.19)
150-154 vs. ≥ 160	0.79 (0.66, 0.94)



Key Findings

- In randomized comparisons, progressive reduction in CVD risk at lower levels of achieved SBP.
- Similar findings for stroke, CHD and all-cause mortality
- Similar pattern in sensitivity analyses in which: SPRINT and 4 other trials with risk for bias were excluded

Bundy JD *et al. JAMA Cardiol. 2017;2:775-781*

SUMMARY: TREATMENT RECOMMENDATIONS

- *Lifestyle modification is the cornerstone of the treatment of hypertension.*

- *New thresholds for initiation of antihypertensive drug therapy in stage1 hypertension, use of ASCVD risk estimation to determine whether to treat with*
  - *Nonpharmacological therapy alone ("low" risk patients)*
  - *Antihypertensive drug therapy, in addition to nonpharmacological therapy ("high" risk patients)*

- *New target for BP reduction during treatment of hypertension*

Recommendations

Recommendations for Treatment of Hypertension in Older Persons References that support recommendations are summarized in Online Data Supplement 54.		
COR	**LOE**	**Recommendations**
I	A	3. Treatment of hypertension with a SBP treatment goal of less than 130 mm Hg is recommended for noninstitutionalized ambulatory community-dwelling adults (≥65 years of age) with an average SBP of 130 mm Hg or higher).
IIa	C-EO	4. For older adults (≥65 years of age) with hypertension and a high burden of comorbidity and limited life expectancy, clinical judgment, patient preference, and a team-based approach to assess risk/benefit is reasonable for decisions regarding intensity of BP lowering and choice of antihypertensive drugs.

Rationale for Blood Pressure Goal of <130 mmHg in Older Adults

- **Large number of older adults have been enrolled in BP lowering treatment trials**

- **BP lowering trials have shown:**

  - **Decreased CVD morbidity and mortality**

    - SPRINT Research Group. JAMA.2016;315:2673-2682.

  - **No increased risk for falls or orthostatic hypotension**

    - SPRINT Research Group. JAMA.2016;315:2673-2682.

    - ACCORD: Margolis KL et al. JGIM. 2014; 29:1599-606.

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Strategies to Improve Hypertension Treatment and Control

Antihypertensive Medication Adherence Strategies

COR	LOE	Recommendations for Antihypertensive Medication Adherence Strategies
I	B-R	In adults with hypertension, dosing of antihypertensive medication once daily rather than multiple times daily is beneficial to improve adherence.
IIa	B-NR	Use of combination pills rather than free individual components can be useful to improve adherence to antihypertensive therapy.

Strategies to Promote Lifestyle Modification

COR	LOE	Recommendation for Strategies to Promote Lifestyle Modification
I	C-EO	Effective behavioral and motivational strategies to achieve a healthy lifestyle (i.e., tobacco cessation, weight loss, moderation in alcohol intake, increased physical activity, reduced sodium intake, and consumption of a healthy diet) are recommended for adults with hypertension.

Structured, Team-Based Care Interventions for Hypertension Control

COR	LOE	Recommendation for Structured, Team-Based Care Interventions for Hypertension Control
I	A	A team-based care approach is recommended for adults with hypertension.

EHR and Patient Registries

COR	LOE	Recommendations for EHR and Patient Registries
I	B-NR	Use of the EHR and patient registries is beneficial for identification of patients with undiagnosed or undertreated hypertension.
I	B-NR	Use of the EHR and patient registries is beneficial for guiding quality improvement efforts designed to improve hypertension control.

Telehealth Interventions to Improve Hypertension Control

COR	LOE	Recommendation for Telehealth Interventions to Improve Hypertension Control
IIa	**A**	Telehealth strategies can be useful adjuncts to interventions shown to reduce BP for adults with hypertension.

Performance Measures

COR	LOE	Recommendation for Performance Measures
IIa	**B-NR**	Use of performance measures in combination with other quality improvement strategies at patient-, provider-, and system-based levels is reasonable to facilitate optimal hypertension control.

Quality Improvement Strategies

COR	LOE	Recommendation for Quality Improvement Strategies
IIa	**B-NR**	Use of quality improvement strategies at the health system, provider, and patient levels to improve identification and control of hypertension can be effective.

Financial Incentives

COR	LOE	Recommendations for Financial Incentives
IIa	**B-R**	Financial incentives paid to providers can be useful in achieving improvements in treatment and management of patient populations with hypertension.
IIa	**B-NR**	Health system financing strategies (e.g., insurance coverage and copayment benefit design) can be useful in facilitating improved medication adherence and BP control in patients with hypertension.

The Plan of Care for Hypertension

COR	LOE	Recommendations for Financial Incentives
I	C-EO	Every adult with hypertension should have a clear, detailed, and current evidence-based plan of care that ensures the achievement of treatment and self-management goals, encourages effective management of comorbid conditions, prompts timely follow-up with the healthcare team, and adheres to CVD GDMT.

Clinician’s Sequential Flow Chart for the Management of Hypertension

Clinician’s Sequential Flow Chart for the Management of Hypertension
Measure office BP accurately
Detect white coat hypertension or masked hypertension by using ABPM and HBPM
Evaluate for secondary hypertension
Identify target organ damage
Introduce lifestyle interventions
Identify and discuss treatment goals
Use ASCVD risk estimation to guide BP threshold for drug therapy
Align treatment options with comorbidities
Account for age, race, ethnicity, sex, and special circumstances in antihypertensive treatment
Initiate antihypertensive pharmacological therapy
Insure appropriate follow-up
Use team-based care
Connect patient to clinician via telehealth
Detect and reverse nonadherence
Detect white coat effect or masked uncontrolled hypertension
Use health information technology for remote monitoring and self-monitoring of BP

ASCVD indicates atherosclerotic cardiovascular disease; BP, blood pressure; CVD, cardiovascular disease; and SBP, systolic blood pressure.

BP Thresholds for and Goals of Pharmacological Therapy in Patients With Hypertension According to Clinical Conditions

Clinical Condition(s)	BP Threshold, mm Hg	BP Goal, mm Hg
General		
Clinical CVD or 10-year ASCVD risk ≥10%	≥130/80	<130/80
No clinical CVD and 10-year ASCVD risk <10%	≥140/90	<130/80
Older persons (≥65 years of age; noninstitutionalized, ambulatory, community-living adults)	≥130 (SBP)	<130 (SBP)
Specific comorbidities		
Diabetes mellitus	≥130/80	<130/80
Chronic kidney disease	≥130/80	<130/80
Chronic kidney disease after renal transplantation	≥130/80	<130/80
Heart failure	≥130/80	<130/80
Stable ischemic heart disease	≥130/80	<130/80
Secondary stroke prevention	≥140/90	<130/80
Secondary stroke prevention (lacunar)	≥130/80	<130/80
Peripheral arterial disease	≥130/80	<130/80

ASCVD indicates atherosclerotic cardiovascular disease; BP, blood pressure; CVD, cardiovascular disease; and SBP, systolic blood pressure.

Publication Information

This slide set is adapted from the 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/ NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults

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Whelton PK, Carey RM, Aronow WS, Casey DE Jr, Collins KJ, Dennison Himmelfarb C, DePalma SM, Gidding S, Jamerson KA, Jones DW, MacLaughlin EJ, Muntner P, Ovbiagele B, Smith SC Jr, Spencer CC, Stafford RS, Taler SJ, Thomas RJ, Williams KA Sr, Williamson JD, Wright JT Jr. **2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines**. *Hypertension*. 2017. HYP.0000000000000065, originally published November 13, 2017. https://doi.org/10.1161/HYP.0000000000000065.

The full-text guidelines are also available on the following websites:

AHA (professional.heart.org)

ACC (www.acc.org)

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